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ABSTRACT

The World Summit on the Information Society will be held in two phases: Geneva, December 10-12, 2003 and Tunis in 2005. The Summit began as an initiative of the 1998 ITU Plenipotentiary Conference when it was recognized that the gap between information "haves" and "have nots" was increasing while at the same time telecommunications were playing an increasingly important role at the political, economic, social and cultural level. The main challenge that the World Summit on the Information Society has to address, is the digital divide. A second challenge of the Summit is to work towards ensuring the free flow of, and equitable access to, data, information, best practices and knowledge across all sectors and disciplines. A third challenge of the Summit is to build international consensus on newly required norms and principles to respond to emerging ethical challenges and dilemmas of the information society. Following the Introduction, this paper discusses the United Nations Educational, Scientific and Cultural Organization's (UNESCO's) contribution to the World Summit on the Information Society (WSIS) and the following proposed WSIS themes: the needs of users; services and applications; and information and communication technologies and education. Several principles and actions for consideration by the Summit are identified. A second section focuses on UNESCO's preparatory work for the Summit and the two levels on which it is acting: the governmental level involving Members' States through their National Commissions for UNESCO and the non-governmental level through professional communities and civil society. (AEF)

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UNESCO and the World Summit on the Information Society

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UNITED NATIONS EDUCATIONAL,
SCIENTIFIC AND CULTURAL ORGANIZATION

Introduction

1. The emergence of the Information Society is a revolution comparable to the deep transformation of the world engendered by the invention of the alphabet and the printing press. A new culture is emerging, based on symbols, codes, models, programs, formal languages, algorithms, virtual representations, mental landscapes, which imply the need for a new "information literacy". Information and knowledge have not only become the principal forces of social transformation. They also hold the promise that many of the problems confronting human societies could be significantly alleviated if only the requisite information and expertise were systematically and equitably employed and shared.

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2. There can be no doubt that the emergence of an information society, at very different rates in different parts of the world, arouses great hopes. But these developments have to confront the extreme disparities of access to this new culture and this new literacy between the industrialized countries and the developing countries, as well as within societies themselves.

3. The World Summit on the Information Society will be held in two phases. The first phase will be held in Geneva 10-12 December 2003 and the second phase in Tunis in 2005. The Summit began as an initiative of the 1998 ITU Plenipotentiary Conference when it was recognized that the gap between information "haves" and "have nots" was increasing while at the same time telecommunications were playing an increasingly important role at the political, economic, social and cultural level. The anticipated outcome of the Summit is to develop a clear statement of political will and a concrete plan of action for achieving the goals of the Information Society, while fully reflecting all the different interests at stake.

4. In order for the Summit to be a milestone in the Information Society, it must bring together the broad range of concerned stakeholders from both the developed and developing world. In this regard, it will provide a unique opportunity for Heads of State, UN agencies, industry leaders, NGOs and civil society, including the media, to gather and discuss all relevant issues in the Information Society.

5. In this perspective, the main challenge that the World Summit on the Information Society has to address, is the digital divide. This divide accentuates disparities in development, excluding entire groups and countries from the benefits of information and knowledge. This is giving rise to paradoxical situations where those who have the greatest need for them – disadvantaged groups, rural communities, illiterate populations, or even entire countries – do not have access to the tools which would enable them to become fully fledged members of the information society.

6. A second challenge of the Summit is to work towards ensuring the free flow of, and equitable access to, data, information, best practices and knowledge across all sectors and disciplines. For free flow to be meaningful, access to information alone will not be enough. Other needs must also be addressed, such as developing appropriate contents as well as building human capacities and technical skills conducive to translating knowledge and information into assets of empowerment and production.

A third challenge of the Summit is to build international consensus on newly required norms and principles to respond to emerging ethical challenges and dilemmas of the information society. In view of the vast prospects for creation and innovation opened up by technological changes, particular attention must be paid to ensuring authentic cultural diversity and promoting genuine pluralism to reduce the risks of homogeneity in the fields of education, culture, sciences and communication. The growing commercialization of many of these spheres previously considered as public goods affects weaker, economically less powerful but nevertheless equally important segments of the world community. Technological developments and powerful mechanisms of control demand new approaches to the protection of the rights of the individual that, at the same time, ensure adequate protection against e-piracy which severely affects the development of creativity.

A. UNESCO's Contribution to WSIS

8. UNESCO's mandate to bolster respect for universal norms and values are of particular relevance in the development of the Information Society in general and the preparation of the Summit in particular. UNESCO's core missions – to promote "the free exchange of ideas and knowledge" and to "maintain, increase and diffuse knowledge" – have possibly never been more relevant as ICTs open up new horizons for progress and the exchange of knowledge, education and training, and for the promotion of creativity and intercultural dialogue.

9. Therefore, UNESCO stands ready to contribute to the goals of the Summit its specific vision and competence according to the following three main strategic thrusts of the Organization:

- Developing universal principles and norms, based on shared values, in order to meet emerging challenges in education, science, culture and communication and to protect and strengthen the "common good";
- Promoting pluralism, through recognition and enhancement of diversity together with the observance of human rights;
- Promoting empowerment and participation in the Information Society through equitable access, capacity-building and sharing of knowledge.

10. The growth of networks and ICT applications will not in itself provide the foundations for knowledge societies. Knowledge societies, capable of applying information and knowledge to the generation of new knowledge in an iterative process, are built up through long-term institutional, social and political mediations. Knowledge societies are, thus, not just other dimensions of the market economy. They inevitably induce the need for a clear vision of social goals to be attained - particularly in order to enhance equitable access to education and knowledge - and for fundamental policy choices to be made.

11. In short, information is not enough. Even information for all is not enough. The information society has to be shaped in such a way that it evolves into knowledge societies that fully respect the huge diversity of cultures and identities and the universality, indivisibility and interdependence of human rights. Beyond the information society, UNESCO's efforts are designed to pursue that goal.

12. It is precisely in UNESCO's fields of competence - education, science, culture and communication – that the impact of ICTs on the activities and product of the human mind is most strongly felt. UNESCO, thus, puts emphasis on the content aspect of the Information Society, including its socio-cultural and ethical dimensions.

13. UNESCO's contribution to the Summit focuses on four main objectives, which strongly correlate with the themes of the Summit: each of these objectives, their underlying principles and related actions contribute to the themes that structure the preparation of the Summit and its Declaration of Principle and Plan of Action:

- Agreeing on common principles for the construction of knowledge societies;
- Promoting the use of ICTs for capacity-building, empowerment, governance and social participation;
- Strengthening capacities for scientific research, information sharing and cultural creations, performances and exchanges;
- Enhancing learning opportunities through access to diversified contents and delivery systems.

14. For the information society to evolve into knowledge societies, it should be based on the sharing of knowledge and incorporate all the socio-cultural and ethical dimensions of sustainable development; beyond the technological aspects, it should take account of the human dimension of the digital divide; and, most importantly, it should be strongly based on a commitment to human rights and fundamental freedoms.

15. The Summit should therefore focus on the need to reinforce the right to education, to strengthen international scientific and intellectual cooperation, to protect cultural heritage and bolster diversified cultural expression, to promote media development and to broaden public domain access to information and knowledge.

16. The right to education is a human right and unless it can be secured, all other development goals are bound to suffer. Free, compulsory and universal primary education for all is among the most clearly defined of these rights which governments have a duty and responsibility to make a reality. Advancing the right to education should therefore be a central concern in the Information Society and strong emphasis should be placed on harnessing the potential of ICTs so as education becomes truly inclusive, in particular by effectively reaching the un-reached.

17. Freedom of expression as enshrined in Article 19 of the Universal Declaration of Human Rights is the condition *sine qua non* for the self-realization and participation by citizens in a democratic setting, for promoting diversity, for scientific progress and for the preservation of peace. Indeed, the freedom of expression, and its corollary, the freedom of the press, represent pillars of every democratic society. They must remain of prime concern in the Information Society which should devise new approaches to ensure freedom of expression, access for all, and the free flow of information and knowledge within the new media landscape generated by ICTs.

18. In the era of globalization, the preservation and promotion of cultural diversity is of prime importance. The information society must aim at ensuring the full realization of cultural rights, as stipulated by the UNESCO Universal Declaration on Cultural Diversity, whereby all persons have the right to express themselves, to create and disseminate their work in the language of their choice - particularly in their mother tongue; all persons are entitled to quality education and training that fully respect their cultural identity; and all persons have the right to participate in the cultural life of their choice and conduct their own cultural practices, subject to respect for human rights and fundamental freedoms.

19. While the Summit should pay due attention to the need of ensuring diversity of the supply of educational and scientific material and creative work, it should duly recognize the rights of authors and artists and the specificity of educational and cultural goods and services which, as vectors of identity, values and meaning, must not be treated as mere commodities or consumer goods. In the face of current imbalances of educational and cultural goods and services at the global level, its is necessary to reinforce international cooperation and solidarity aimed at enabling all countries, especially developing countries and countries in transition, to develop ICT-based educational services and to establish cultural industries that are viable and competitive at national and international level. From this perspective, the pre-eminence of public policy, in partnership with the private sector and civil society, must be reaffirmed.

20. The Summit should promote the protection and strengthening of the "global public good" in the Information Society which include, for example, the equitable access to information for educational, scientific and cultural activities, a vibrant public domain of information, as well as the concept of public service broadcasting acting in the public interest.

a) WSIS proposed theme: The needs of the users

UNESCO: Promoting the use of ICTs for empowerment, governance and social participation

21. The world community should be encouraged to promote in the Information Society the observance of universally recognized values and of the principles enshrined in the Universal Declaration of Human Rights: freedom of expression and its corollary, freedom of the press, respect for privacy, security of the person, including the protection of children and young people against violence and pornography, the rights to information and education, protection of the moral and material interests inherent in intellectual works, fair use of educational, scientific and cultural works, respect for legality, universal principles of law and ethics.

22. The use of the Internet and ICT-related applications to advance democracy should be equally highlighted. The use of ICTs is potentially beneficial to development as it encourages the sharing of information and the effective involvement by social groups at various levels, offering, in particular, the possibility of networking individuals and systems. The participatory aspect of community life is thus strengthened, as are relations with authorities, at all levels. The Summit, therefore, should promote the development of appropriate information and communication tools to support decision making processes and encourage dialogue between citizens and public authorities, thereby reinforcing democratic governance and citizen participation.

23. The Summit should also encourage initiatives to promote the use of ICTs, in particular multi-purpose community telecentres (MCTs) and community multimedia centres (CMCs), for educational,

scientific or cultural purposes or in support of development programmes. The strategy should focus on the integration of new technologies and "traditional" technologies such as library services and community media; the production, adaptation, translation and sharing of local contents; the setting up of pilot projects corresponding to different cultural contexts and stages of development; the evaluation and exchange of experience at the national and international levels and the formulation and implementation of national policies to encourage community action and cooperation.

24. For an Information Society to be open and inclusive, high priority should be devoted to addressing the needs of those disadvantaged and marginalized groups that are normally excluded or "un-reached". Improving access to the benefits of the Information Society for women and youth is another essential issue. The Summit should therefore adopt principles and encourage actions that actively assist women and young people in participating in the process both of producing and «consuming» information. For women, the strategy should be aimed at helping them to benefit from ICTs for network strengthening, information sharing, creating knowledge resources and developing skills necessary for work in the new media industries. For youth, the Summit should set the ground for the creation of national and regional youth information and communication networks, and by providing appropriate technologies and training to disadvantaged young people, specialized NGOs and youth leaders.

Principles and actions for consideration by the Summit

Principles

- The Information Society is only equitable if all people, including disadvantaged and marginalized groups, as well as women and youth benefit equally from ICTs for network strengthening, information sharing, creating knowledge resources and developing skills necessary for life/work in the new digital environment.
- The enhancement of dialogue between citizens and public authorities must be one of the major objectives of the Information Society.
- The Information Society must be based on the sharing of information and the genuine participation of social groups at various levels; and on the use of ICT as a means of empowering local communities and help them combat marginalization, poverty and exclusion.

Actions

- Consensus building on common shared values and ethical principles that should underlie the Information Society.
- Promoting the creation and sharing of local content and ICT applications and studying their impact.
- Fostering increased participation of citizens in civic life and in decision making by means of ICTs.
- Strengthening capacity building for ICT use by citizens including through networked MCTs and CMCs.
- Promoting the development of appropriate information and communication tools to support decision making and to encourage dialogue.
- Encouraging the formulation of policies for enhancing the role of women and youth in the Information Society, and the diffusion of information on gender and ICT policy issues.
- Promoting the access to information and knowledge sources of youth as a prerequisite for their competent social choice, behaviour and participation.
- Improving training of women and youth in ICT literacy and technical skills in order to enable them to enter empowered into the information society.

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b) **WSIS proposed theme: Services and applications**

UNESCO: Strengthening capacities for scientific research, information sharing, cultural creation, performances and exchanges

25. The importance of the production and dissemination of quality educational, scientific and cultural materials, of independent and pluralistic media, and the preservation of the digital heritage should constitute an important aspect of its Declaration of Principles and Plan of Action.

26. The Summit should also emphasize how ICTs can, in particular through the formation of networks of specialists or of virtual interest groups, increase exchanges and cooperation in the fields of education, science, culture and communication. The Summit should encourage the use of new methods of content development and access to education and to scientific information – virtual universities, virtual laboratories and research groups. The development of such methods contribute to bridging the scientific divide, notably by enabling researchers in developing countries to participate in research at the international level and to share its results. In this context, the Summit should encourage actions that focus on building linkages and synergies between science and local and indigenous knowledge, so as to transform environmental management practices; and to revitalize the intergenerational transmission of local knowledge, in tandem with conventional forms of education. It should also support initiatives aimed at developing local and indigenous knowledge systems as a means of empowering local communities and a tool to combat marginalization and impoverishment.

27. Independent and pluralistic media, public service broadcasting and community media play an important role in two fundamental aspects of an inclusive information society by promoting participatory governance and democracy and by fostering informed public opinion. The Summit should acknowledge this role. It should also recognize the importance of capacity building in this area that includes the strengthening of media and communication, training of media professionals and media education for the public. Strategic importance should be given to all forms of capacity building that promote the effective use of new ICTs by traditional media and by new and emerging media.

28. ICTs hold the potential to foster hitherto unknown types of engagement, contacts and interaction among individuals, peoples, communities, nations, cultures and civilizations: ICTs that are bringing about decisive changes in the way cultures are created and communicated also have to meet new social demands. The Summit should promote those types of links with a view to building peace and solidarity at all levels and to reduce isolation and exclusion.

29. The promotion of creativity, the protection and safeguarding of cultural heritage which is of the essence for protecting cultural diversity, intensified intercultural cooperation, new forms of cultural exchanges and dialogue among cultures and civilizations leading to better understanding and interaction are other important areas to be covered by the Summit in this context.

Principles and actions for consideration by the Summit

Principles

- For the Information Society to be equitable for all, access to and participation in all forms of intellectual activity for educational, scientific, cultural and communication purposes must be ensured.
- The production and dissemination of educational, scientific and cultural materials and the preservation of the digital heritage should be regarded as crucial elements of the Information Society.
- Networks of specialists and of virtual interest groups should be developed as they are key to efficient and effective exchanges and cooperation in the Information Society.

Actions

- Enhancing the capabilities of national institutions in developing countries to adapt to the demands of the information society.
- Improving access by developing countries to ICTs for scientific data and information dissemination.
- Increasing the effective use of ICTs for better transmission and sharing of scientific knowledge at all levels, including the establishment of virtual universities, also taking into account local and indigenous knowledge.
- Fostering the use of ICTs by cultural industries in developing countries.
- Contributing to broadening the international exchange of cultural goods and services through the development of endogenous cultural industries; fostering the use of ICTs for exhibition, promotion and marketing of cultural works.
- Developing an international framework for the preservation of digital heritage.

c) **WSIS proposed theme: ICTs and Education**

UNESCO: Enhancing teaching and learning opportunities through access to diversified contents and delivery systems

30. ICTs offer the potential to expand the scope of teaching and learning, breaking through traditional constraints of space and time as well as boundaries of current educational systems. Moves towards learning societies are based on the need to acquire new knowledge throughout life. ICTs offer more and more opportunities for learning outside formal education systems. But as educational demand increases and supply diversifies, increased disparities can be observed in respect of access, affordability and quality. The accelerating privatisation of educational goods and services, partly driven by the potential and impact of ICTs, poses an entirely new challenge for the international community.

31. A major challenge of the Summit is to define the best use of ICTs for improving the quality of teaching and learning, sharing knowledge and information, introducing a higher degree of flexibility in response to societal needs, lowering the cost of education and improving internal and external efficiencies of the education system.

32. The Summit should promote the judicious use of ICTs as innovative and experimental tools to renew education, recognize their potential as new delivery mechanisms and for system-wide expansion of educational provision and quality, especially through distance education and open learning opportunities, including through non-formal education.

33. The Summit should recognize as well the potential of ICTs as levers for attaining the Millenium Goals for education and, more generally, the Education For All (EFA) objectives set out by the international community in Dakar in April 2000, and encourage an increased use of ITCs with a view to reaching out to the excluded, to improving the quality of content, to enhancing and upgrading teacher skills, and to establishing and strengthening education management systems.

34. The Summit should emphasize the need for policy dialogue between all actors and stakeholders in education (governmental, non-governmental – in particular teachers' associations -, civil society and

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private sector and intergovernmental organizations) so as to foster better public understanding of educational issues as affected by ICTs. Platforms for dialogue and action involving both the public and private sector providers of educational goods and services should be given particular attention with a view to promoting quality and encouraging participation in all cultural and linguistic settings.

35. The Summit will need to address ethical and legal issues concerning wide-spread use of ICTs in education (e.g. ownership of knowledge; legal and tariff frameworks; learning opportunities and educational materials; new challenges related to education as a commodity; the impact of education on cultural diversity).

36. Finally, the Summit should also recognize that computer literacy is a basic skill for performing in knowledge societies and that ICTs provide the means for a better management and use of educational resources.

Principles and actions for consideration by the Summit

Principles

- ICTs must contribute to enhancing the quality of teaching and learning, the sharing of knowledge and information.
- ICTs have the potential to introduce in the educational process a higher degree of flexibility in response to societal needs.
- The potential of ICTs to lower the cost of education and to improve internal and external efficiencies of the education system must be grasped.
- The Information Society must seize the opportunities of ICTs as innovative and experimental tools to renew education.
- ICTs should be seen both as educational discipline and as pedagogical tools capable of enhancing the effectiveness of educational services.
- Broad-based dialogue among all stakeholders and consensus building at national and international levels can yield strategies and policies for expanding access to education and learning, progressing towards EFA targets at country level and renewing formal and non formal education systems.

Actions

- Disseminating knowledge and best practices related to the use of ICTs in education and learning processes and to their impact on education systems (e.g. through online clearing houses and multimedia resource centres).
- Demonstrating the impact of ICT-based alternative delivery systems through pilot projects, notably for achieving EFA targets.
- Furthering teacher training in the use of ICTs in education and learning as well as new forms of networking of teacher institutions and teachers.
- Promoting the use by governments of ICT-based delivery systems in formal and non-formal education, utilizing different mixes of new and traditional media and appropriate methodologies.
- Disseminating research results on ICT facilitated dynamics of the teaching/learning process and its impact on content and teacher-learner interaction, in particular as regards distance education and teacher training and development.
- Fostering international debate and reflection in favor of developing internationally compatible descriptors and standards for distance and e-learning courseware, and for e-learning institutions.

B. UNESCO's Preparatory Work for the Summit

37. In preparing its input to the Summit, UNESCO is acting on two levels: on the one hand, the governmental level involving Members States through their National Commissions for UNESCO and, on the other hand, on the non-governmental level through professional communities and civil society. In both cases, UNESCO mainly intends to set the ground for the Declaration of Principles and the Plan of Action that the Summit is expected to adopt.

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a) **Involving UNESCO's Member States**

38. UNESCO is closely involving its Member States in the preparation of the World Summit on the Information Society. It is drawing on its intergovernmental bodies, notably the Intergovernmental Council for the Information for All Programme, for the preparation of its contribution to the Summit and to sensitize all Member States to its importance.

39. In addition, a series of regional UNESCO pre-conferences and symposia are being organized in cooperation with the National Commissions for UNESCO, to provide forums for discussions on the regional specificities and challenges of the Information Society in the areas of education, science, culture and communication. For example, the UNESCO Regional Pre-Conference for Africa, held in Bamako (Mali) in May 2002, the UNESCO Regional Pre-Conference for Europe held in June 2002, in Mainz (Germany) on the issue: "Information Cultures and Information Interests". A regional symposium "Informatica 2002: Latin American and the Caribbean Symposium on Education, Science and Culture in the Knowledge Society" was held in Havana (Cuba) in February 2002. An international symposium entitled "Freedom of Expression in the Information Society" will take place in Paris (France) in November 2002.

b) **Involving professional communities and civil society**

40. On the non-governmental level, UNESCO is preparing its contribution to the WSIS through a series of thematic consultations and regional conferences. They are intended to serve as platforms to representatives of civil society and of professional non-governmental organizations working in the area of competence of UNESCO to debate on the Information Society and for the preparation of their input to the Declaration of Principles and the Plan of Action of WSIS. IFLA played an active role in this debate.

In this regard, a series of meetings were organized for representatives of more that 100 organizations in February and April 2002 at UNESCO Headquarter in Paris, France. The results of these meetings have been forwarded to the WSIS Executive Secretariat for submission to the 1st Preparatory Committee meeting (PrepCom I, 1-5 July 2002, Geneva, Switzerland).. More than 600 delegates representing governments, international agencies, business and civil society attended the meeting.

c) **Providing background for discussions and decisions**

41. During the preparation process, UNESCO will prepare and widely distribute (off-line and online) background material for discussions and decisions of the Summit in its areas of competence. This includes studies on specific subjects, such as ICTs and education, cultural diversity and multilingualism, libraries and archives in the Information Society, media in the Information Society, gender issue, access of disabled persons to ICTs, etc..

42. The UNESCO Institute for Statistics (UIS) is preparing a statistical report giving a global picture of the present status of ICT usage in education, sciences, culture and communication. The report will include a representative range of quality statistical information, as well as key indicators measuring the economic and social impact of ICTs. An overview on key Information Society related parameters (data on personal computers, Internet hosts and users, mobile phone subscribers and ICT market) will also be included in the report.

Web site of the World Summit:

http://www.itu.int/wsis/index.html

a)
United Nations Educational, Scientific
and Cultural Organization

a) Executive Board

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Annex I **One hundred and sixty-fourth Session**

164 EX/21
PARIS, 2 April 2002
Original: English

C. Item 3.6.1 of the provisional agenda

43. REPORT BY THE DIRECTOR-GENERAL ON A DRAFT CHARTER ON THE PRESERVATION OF DIGITAL HERITAGE

Annex I

Annex II **SUMMARY**

In accordance with Resolution 31 C/34, the Director-General is hereby submitting to the Executive Board a report on the preservation of digital heritage. This report is a discussion paper highlighting the principles for the preservation and continued accessibility of the world's ever growing digital heritage. It also contains elements for a draft charter and strategy for the preservation of this heritage, which constitutes part of the 'Memory of the World'.

Decision required: paragraph 11.

1. The General Conference adopted Resolution 34 at its 31st session, drawing attention to the ever growing digital heritage in the world and the need for an international campaign to safeguard endangered digital memory. The General Conference also invited the Director-General to prepare a discussion paper for the present session of the Executive Board containing elements of a draft charter on the preservation of born-digital documents, to be submitted for adoption to the General Conference at its 32nd session in 2003, as well as to encourage the governmental and non-governmental organizations and international, national and private institutions to ensure that preservation of the digital heritage be given high priority at the national policy level.

2. A discussion paper was prepared for UNESCO by the European Commission on Preservation and Access. From this paper, attached as Annex I, and preliminary consultations with the actors involved in the digital preservation, a number of major problem areas and courses of actions were identified.

3. A large part of the vast amounts of information produced in the world is digital, and comes in a wide variety of formats: text, database, audio, film, image. For cultural institutions traditionally entrusted with collecting and preserving cultural heritage, the question has become extremely pressing as to which of these materials should be kept for future generations, and how to go about selecting and preserving them. For conventional materials, a certain amount of agreement exists on how to collect information worth preserving.

4. With the advent of digital media, a new and complex environment has come into being. Not only are the media new, but also the contents and the means of distribution have changed dramatically, and new players – among users as well as creators of information - have entered the stage. It has become urgent to establish a clear framework which could facilitate collection, classification and preservation efforts. Technical guidelines will be developed and regional consultations will be convened by UNESCO to stimulate commitment and involvement and establish a clear definition of tasks and responsibilities related to digital heritage, which could then serve as a foundation for an International Charter on the Preservation of Digital Heritage.

5. Legal frameworks defining responsibilities and procedures need to be adapted or extended to be able to deal with the new digital environment. Adequate legislation in this area is a necessary instrument for institutions in order to define tasks and select materials for preservation. Regional consultations should elaborate options on how to extend deposit legislation to all digital materials regarded as publications. It should also establish whether legal frameworks for archives could cover all documents which constitute a record regardless of its format.

6. A wide array of intellectual property rights may be associated with web sites combining mixed materials from various sources. Copyright legislation places such strict limitations on copying that libraries can not even preserve subscribed electronic journals without infringing the rights of owners and creators. Software copyright is another important issue. Agreement on the principle of the right to copy for preservation will therefore have to be sought to make copyright aspects of preservation more easily manageable.

7. The use of standards and adequate description and documentation facilitate long-term preservation of online resources and help to reduce costs. Creators of digital materials and the

ICT industry have to be involved in the process of preservation as their co-operation can reduce the burden for heritage institutions. Creators will have to be encouraged to use open standards and provide adequate documentation of files. The ICT industry should be convinced of the value of open source software and the need to publish detailed and complete documentation to make sure their products can continue to be used in a preservation setting.

8. Co-operation, guidance, leadership and sharing of tasks are all key elements for preservation of digital heritage. Cultural institutions need the co-operation of creators of information and of software producers. Adequate resources and support at policy level are indispensable to ensure that future generations continue to have access to the wealth of digital resources in whose creation we have invested so much over the past decades.

9. Based on the above findings, UNESCO has developed a strategy for the promotion of digital preservation. This strategy is centred on: a) a wide consultation process with governments, policy makers, producers of information, heritage institutions and experts, the software industry as well as standard-setting organisations; b) dissemination of technical guidelines; c) implementation of pilot projects and; d) preparation of a draft charter on the preservation of digital heritage for adoption by the General Conference at its 32nd session;

10. To arrive to the adoption of the Charter, the Director-General suggests the following procedure: In the light of the observations of the Executive Board on the present report, together with the comments expressed by the Intergovernmental Council of the Information for All Programme, during its first session held from 15-17 April 2002, the Director-General shall prepare a Preliminary Draft Charter to be circulated to Member States for broad consultations with policy-makers, professional communities concerned and private sector, requesting their comments and suggestions before January 2003. In keeping with the opinion of the Member-States expressed as result of these consultations, as well as views emerging from regional expert meetings convened by UNESCO, the Director-General shall prepare a Revised Draft Charter and submit it to the 166th session of the Executive Board. It will then be transmitted by the Executive Board, along with its comments, to the General Conference at its thirty-third session, for consideration and adoption.

11. In the light of the above report and the attached discussion paper, the Executive Board may wish to consider the following decision:

The Executive Board,

Having examined document 164 EX/21,

Recognizing that the preservation of digital heritage is an urgent issue of worldwide concern,

Endorses the suggested strategy and procedure,

Invites the Director-General, taking into account the discussions at its 164th session as well as the debates of the Intergovernmental Council of the Information for All Programme at its first meeting in April 2002, to prepare a Preliminary Draft Charter on the Preservation of Digital Heritage to be circulated to Member States for broad consultations and subsequently submit a Revised Draft Charter to the 166th session of the Executive Board.

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(a) Preservation of the Digital Heritage

Discussion paper prepared for UNESCO
by the European Commission on Preservation and Access
(Amsterdam, February 2002)

INTRODUCTION

1. A large part of the world's information is now produced digitally. Digital resources range from medical records to movie DVDs, from satellite surveillance data to web sites presenting multimedia art, from data on consumer behaviour collected by supermarket tills to a scientific database documenting the human genome, from news group archives to museum catalogues.

2. The rapid spread of information technology makes preservation of digital heritage a worldwide concern. More and more digital systems for administrative purposes are being introduced everywhere, and a great many countries are digitizing cultural materials for better access.

3. The speed at which the digital world moves has upturned the order of all established preservation practices. Generations of platforms, programmes and machines succeed one another so quickly that it is a matter of years rather than decades before materials become inaccessible as a result of compatibility problems. The timescale for preservation has shrunk: steps to ensure that digital materials remain accessible have to be taken very early on in their lifecycle.

4. Governments and policy makers should be aware that preservation of digital heritage is an urgent issue and that solutions cannot be found overnight. The risk of losing essential materials in which valuable resources have been invested is very real. It is therefore crucial that countries assume responsibility for digital heritage and take steps to prevent such loss.

EXISTING MODELS AND LEGAL FRAMEWORKS

5. Traditionally, preservation of cultural heritage has been supported by legal frameworks and procedures which are largely based on formal criteria. National libraries collect and preserve publications through legal deposit of the national production, and there is extensive archival legislation defining when and how records must be transferred to archives for selection and preservation. Specialized archives and museums have responsibilities for collecting and preserving sound, photographs or film. Legislation may vary considerably between countries (e.g. regarding the categories of material to which legal deposit applies), but there is wide agreement on the basic principles, and all parties involved in the process are well aware of them.

6. In the digital world, new types of materials have come into being that are hard to classify by conventional criteria. Multimedia materials combine different types of content

with different functionalities. Web sites may combine files with various types of content – data, texts, images, sound– and many of them are (partly) dynamic. Web sites may also be distributed sites including materials stored on different servers at different locations in the world. Such mixed or dynamic materials do not fit into traditional categories; on the basis of existing policies it is often not possible to decide where the primary responsibility for collecting and preserving them should lie.

7. Although we speak of '*publishing* on the internet', it is not at all clear what constitutes an internet publication. Place of publication, an essential criterion in deposit legislation, can no longer be used to define the national production or imprint: domain names do not necessarily reflect where the material is produced and in which language, and many sites are mirrored in other locations.

8. That raises the question of which materials should be considered publications as defined by deposit legislation, and how deposit legislation can be adapted to include digital materials that national libraries should preserve. Although some countries have extended legislation to cover offline publications such as CD-ROMs, the case of online materials is as yet still diffuse.

9. In the archival world, electronic records have taken the place of paper. With records being used for years or even decades, they will inevitably have to be moved from outdated environments to new ones, with the risk of changes or loss of content, functionality or original appearance. In the absence of a fixed object that can be preserved as is, it becomes necessary to decide which elements actually make up an authentic electronic record and need to be preserved.

10. Legal frameworks defining responsibilities and procedures need to be adapted or extended to be able to deal with the new digital environment. Adequate legislation in this area is a necessary instrument for institutions to define tasks and select materials for preservation.

THE INTERNET AS A CULTURAL SPACE

11. The internet consists of one billion pages and keeps growing. A number of these pages are devoted to materials of the kind that we traditionally associate with heritage institutions: electronic journals and articles, newspapers, photographs, catalogues and finding aids, and other kinds of records and documents.

12. However, the internet is an extremely democratic medium, and on the other end of the scale there are innumerable web sites created by individuals and informal groups. Virtual communities of people scattered over the globe but united by shared interests discuss just about anything under the sun, including such topics as endangered languages or regional cooking. Artists experiment with multimedia web sites as new art forms, amateur genealogists present data on their family's history. Taken as a whole the internet in many ways reflects our society, as a huge open space where a variety of cultural activities are pursued.

13. Preservation of digital heritage will somehow have to deal with new manifestations of cultural content on the web, which challenges traditional classifications of materials worth

keeping. Unfortunately, it is risky to rely on time to sift what may prove to be of lasting value from the merely ephemeral. Web sites are changed and updated constantly, and superseded materials vanish without leaving a trace. Estimates for the average life expectancy of a web page vary from 44 days to two years. When organizations go out of business or lose interest, whole web sites disappear from sight.

14. This not only happens with informal or temporary sites, but also with central and official ones. Some heritage institutions, recognizing the risks posed by the instability of the internet, have opted for a proactive approach. From the wide diversity of materials on the web, they aim to safeguard access to what is potentially of lasting cultural value. However, their work is complicated by the fact that there are no established formal criteria to select web sites for preservation. New policies need to be developed to ensure that all kinds of web content that may be of value for later generations are indeed saved for posterity.

APPROACHES TO DIGITAL PRESERVATION

15. A number of initiatives to preserve digital materials have been ongoing for some time. In scientific and scholarly research, computerized data have been created and used for decades. The space and earth observation communities, using massive amounts of data that need to be studied over a long period of time, have been very active in developing a reference model for archiving data that is being widely adapted. Data archives, especially in the social sciences and the humanities, have for years been collecting data sets created in research projects so that they are maintained and can be re-used.

16. National libraries generally approach the digital environment from the angle of deposit legislation. Deposit of offline digital products, such as CD-ROMs, is in several countries already a legal requirement. Online electronic journals are treated as an extension of a long tradition of print publishing, which libraries have always collected and preserved. To ensure continued access to the whole of the scientific electronic journal environment, including live links, data and multimedia presentations, libraries are now trying to come to arrangements with publishers about deposit, as yet often on a voluntary basis.

17. Several libraries have developed strategies for selecting and preserving web sites on the basis of a concept of 'publication', of which the Pandora project of the National Library of Australia is perhaps the best-known example. 'Publication' is defined here in broad terms: anything on the internet is regarded as a publication, only organisational records are explicitly excluded. At the center of the policy is the idea of national production constituting national cultural heritage: sites selected for preservation should be about Australia, or deal with a topic highly relevant for Australia and written by an Australian. Selection is determined by content and 'high priority is given to authoritative publications with long term research value'.

18. Some national archives, as for instance the Public Record Office and the National Archives of Australia, have extended policies for electronic record management to include web sites of government agencies (public sites as well as intranet sites) and developed guidelines describing best practices. The Public Record Office warns that materials on web sites are not always recognized as records. Rigorous records management is required also for web sites. Responsibilities and procedures for identifying records and managing them remain valid in the internet world.

19. Other institutions are focusing on collecting materials in a specific discipline. The International Institute of Social History, as a research institute with the task of collecting and archiving materials relating to social history, decided in 1994 to collect internet documents on politics, social affairs and ecological issues. Their collection policy is exceptional in that it also includes newsgroups, and they have now collected 900,000 messages from 974 newsgroups which are accessible over the internet.

20. Apart from these selective approaches for preserving web content, there are also examples of comprehensive approaches, which collect enormous numbers of web pages without any selection for content. The Internet Archive, started in 1996 as a private, non-profit enterprise, collects freely available web pages worldwide and now comprises over 10 billion web pages or 100 terabytes of data (5 times the size of all the materials held by the Library of Congress). The Internet Archive launched a 'Wayback Machine' in October 2001 to provide free access to the archive over the web.

21. In Sweden, the Kulturarw3 Heritage Project has been harvesting Swedish web sites since 1996. In the Finnish EVA project all 'the freely available, published, static HTML-documents with their inline material like pictures, video and audio clips, applets etc' in the .fi domain are harvested. This activity of harvesting all materials freely published in the Finnish internet is regarded as complementary to the legal deposit of paid materials by established publishers.

22. At the moment, the main aim of these initiatives is to save web materials that would otherwise in any case have been lost forever. However, rendition of captured sites is as yet incomplete, for capturing online information is extremely complex. Links to external sites will in many cases be broken and interactive navigation cannot always be retained. More and more web pages are dynamic, generated 'on the fly' by databases hidden behind the static front end of the site. It is estimated that the databases behind web sites, together called the 'deep web', contain many more times the amount of information accessible on the surface . The information in those databases cannot be captured by copying the web site, as it is not available in ready-made pages at the surface. Moreover ,after only five years of archiving, there is no saying yet how it can be ensured that these materials will still be available after 25 or 50 years.

23. In spite of many uncertainties, the initiatives taken by memory institutions are valuable explorations of the legal, organizational, economic and technical frameworks required for preservation of on- and offline materials. The experience gained by the pioneers in this area will be of huge benefit to the whole cultural sector and will contribute considerably to the development of infrastructure and policies for preservation.

WHAT IS PRESERVATION OF DIGITAL HERITAGE

24. In the world of print, preservation can be achieved by preserving the paper object or, if that is not feasible, creating a durable surrogate for instance on microform The equivalent in the digital world would be, for example, to preserve a CD-ROM, or transfer its contents to another type of carrier. However, this does not achieve much more than preservation of the actual bits that make up a file. Whereas this is obviously a necessary condition for preservation, it is not sufficient to ensure that the information can be read and interpreted in the long run.

25. As file formats and programmes also become outdated, preservation of digital materials has to deal not only with maintenance of the files themselves but also with ways of keeping them accessible. This means that either the programmes have to be preserved as well and somehow kept running on new platforms, or the files have to be converted to another format that can be interpreted by new programmes. As the digital world moves on all the time, this is a continuous process if materials need to be kept accessible for decades (or even forever). In many cases this will, sooner or later, result in loss of information, functionality and/or appearance, especially with complex, multimedia materials that combine a variety of file formats and applications.

26. This poses risks for integrity of digital materials: how can it be ensured that the digital object, moving from one environment to the next, remains complete and undamaged? A different but related issue is authenticity, which relates to the trustworthiness of materials, in particular of electronic records. As records are used for accountability and as evidence of transactions, it is crucial for future reference that the original exists as it was first created and that the record indeed is what it purports to be. Integrity and authenticity do not only depend on protecting files against intentional changes by unauthorized persons, but also on controlling inadvertent changes resulting from misinterpretation or misrepresentation by computer systems.

27. Preservation of digital materials is first of all a matter of defining the content and properties that need to be represented in future systems. For instance, data in a complicated table may be 'frozen', i.e. only the results of the calculations are kept, not the software to produce them- or they may be kept 'alive', by retaining the software, thus offering future users possibilities for searching, selecting and sorting.

28. If optimal functionality and access is the primary goal, it may even be necessary to upgrade to future requirements and devise systems that can incorporate the improvements of developing technology. Otherwise, future users will have to be satisfied with a level of access and functionality limited to what was possible in days (then) long gone.

29. In contrast, if there are reasons for representing materials in a historical context, one may wish to retain as much as possible of the original, so that future users can experience the material as we experience it now. These issues come up in the preservation of electronic art as for some artists the way the work is displayed (e.g. on a specific type of screen or using a specific browser) is an integral part of the work. To ascertain what the work really is and how it is meant to be shown, museums now often collect information on artists' intentions to guide preservation efforts.

30. As the aim of preservation varies, so will the requirements for future representation and consequently the technology to meet them In all cases, adequate representation at a later stage depends on the identification of the type of content and file formats as well as the software that makes access possible. Only if one knows what one is dealing with can suitable preservation measures be taken. Documentation starts at the lowest level, by describing the characteristics of the bit stream as well as the hardware/software environment capable of rendering the object in its present form.

31. Additional documentation is needed to understand and evaluate what is presented: information presented as such, without context and background information, will be hard to

'place'. It makes all the difference for understanding a map with red dots on it whether it was used for geological exploration or military actions, and this cannot always easily be seen from the map itself if it is presented in isolation. It therefore needs to be specified how and when the material came into being, who has held it, and how it relates to other information.

32. Documentation of materials is a prerequisite for understanding how they are meant to be preserved, and constitute a considerable additional burden on heritage institutions. To facilitate preservation, efforts will have to concentrate on developing standards for documentation for specific classes of materials and on exploring how processes can be partly automated.

TECHNOLOGICAL ISSUES

33. Most digital materials cannot meaningfully exist outside the digital environment. Printing the information out on paper to preserve it would only work for a small category of straight text files. Generally, in order to use the material at some future moment as it is meant to be used, both content and functionality need to be preserved. Preservation of digital materials is therefore a complex technological task that has to deal with several aspects simultaneously.

34. Basically, there are three ways in which digital materials can become inaccessible: (1) degradation of the media on which they are stored, (2) obsolescence of software making it impossible to read digital files, and (3) introduction of new computer systems and peripherals that cannot handle older materials.

35. Tapes and disks are all subject to physical decay and none of them has a lifespan that is comparable to that of preservation-standard microfilm or acid-free paper. They need to be stored under controlled conditions, but even so materials should be copied onto new media at regular intervals to prevent loss through deterioration of carriers. 'Refreshment' of materials, i.e. transferring them to new media, often becomes necessary because a specific type of disk or tape can no longer be used in current computer systems. The disappearance of the 5 1/4 disk and the accompanying disk drives is a case in point. Refreshment is a recurring activity in any preservation programme.

36. Obsolescence of software and hardware leads to (partial) loss of information or functionality of files in their original format. Successive versions of programmes may be compatible, but software producers do not usually support compatibility over a long period. Programmes disappear from the market or can no longer be used on a new platform. The combination of dependence on old versions of programmes that used to run on old platforms of outdated computer systems inevitably spells digital death.

37. For the short term, it may be possible to keep the original environment (hardware and software) functioning. There is, however, wide agreement that this will not work in the long run, as it will result in an ever-growing collection of outdated computers and peripherals that is very hard to maintain over time.

38. Different approaches have been suggested to combat obsolescence of software and hardware. One method is to convert files to new platforms or different programmes. This is especially attractive if they can be converted to a standard, non-proprietary format, as this facilitates maintenance over time. However, conversion may lead to unacceptable loss of

functionality, especially with complex databases or multimedia materials. Even with relative simple materials it is hard to predict the cumulative effect of successive conversions over time.

39. Other approaches aim to recreate superseded versions of operating systems and programmes in new environments, so that the files can be kept in their original format and read with the software in which they were first created. This is certainly a way to bridge one or two generations of platforms, but over time, as new systems keep being introduced, one may be faced with a Chinese boxes effect that becomes complex to handle. Another disadvantage may be that functionality is kept at the level of outdated systems, which may not be very satisfactory for future users.

40. It is as yet uncertain what will prove to be feasible and successful, and many institutions are doing research, creating test beds and pilots to gain more experience with potential solutions. In the meantime, a better appreciation of the risks and complexities among producers of digital materials could make all the difference for institutions engaged in developing preservation systems.

41. Producers can facilitate preservation efforts by using (official or *de facto*) standards, like XML, TIFF or PDF. The use of proprietary software complicates matters not only because it is protected , but also because it is often inadequately documented, which makes it impossible to predict the outcome of a conversion in every detail.

42. Creators of digital materials and the ICT industry have to be involved in the process of preservation as their cooperation can reduce the burden for heritage institutions. Creators will have to be encouraged to use open standards and provide adequate documentation of files. The ICT industry should be convinced of the value of open source software and of the need to publish detailed and complete documentation, to make sure their products can continue to be used in a preservation setting.

43. The technology for preserving digital materials requires investments in research and development that are substantial. However, such investments are negligible compared to the resources invested in creating the materials in the first place, and the cost to society if no adequate systems are developed and materials are thereby lost.

ORGANIZATIONAL ISSUES AND RESPONSIBILITIES

44. Traditionally, the roles of creators and of keepers of information have been quite distinct. Basically, those who created materials had no interest in their preservation, and those who kept materials had no control over their creation. This division of tasks has to be abandoned in the digital world. Preservation requirements have to be taken into account very early on, even at the point when material is created, and 'the first line of defence against loss of valuable information rests with the creators, providers and owners of digital information'.

45. Creators should be made aware that choices made at the time of creation affect the possibilities for later archiving. The use of standards and open formats, adequate description and documentation, and the use of permanent names for online resources facilitate long-term preservation and help to reduce costs. Creators should realize how good practice in producing digital materials can help to maintain them over time.

46. Many producers of information manage their own materials for some considerable time after they have been created and in doing so will have to deal with preservation-related issues. Record-creating agencies often have to retain records for decades and have to make sure they can be accessed and used: in the past, national archives were expected to take preservation measures for records which they received only after twenty or thirty years.

47. Publishers are motivated to keep digital materials accessible for some time, often storing them in standard formats such as SGML and XML, because it is commercially attractive to be able to re-use them for new products. Also, as libraries do not physically hold the e-journals to which they subscribe, they depend on publishers for such continued access to older materials. At the same time, the publishing industry underwrites the role of libraries and relies on them for long-term preservation. A joint draft statement of IFLA and IPA explicitly distinguishes short-term archiving by publishers (for as long as publications are economically viable) and long-term archiving by libraries.

48. The cooperation of creators and owners of information in developing working models for preservation is crucial. For instance, copyright issues need to be resolved before libraries can take any steps to maintain materials. Copyright legislation places such strict limitations on copying that even transferring files to the library's system may constitute an infringement of the rights of owners and creators. Although publishers recognize that copyright may be a barrier for long-term preservation, they are at the same time wary of any arrangement that would interfere with their commercial interests, by making deposited materials easily accessible on networks.

49. There are some examples of arrangements between libraries and publishers that aim to balance the interests of both parties, allowing copying only for preservation purposes while restricting access. However, rights management is developing into an extremely complex area and not all aspects can be covered by agreements between publishers and libraries. When a digital product relies on proprietary software owned by third parties, the creator of the content does not usually hold these rights. Software vendors have so far hardly been involved in preservation efforts and software is not usually covered by deposit legislation. A dazzling array of rights may be associated with web sites combining mixed materials from various sources. Agreement on the principle of the right to copy for preservation will therefore have to be sought to make copyright aspects of preservation more easily manageable.

50. Ideally, responsibility for preservation is shared by creators and keepers, each maintaining materials during a certain stage of their life cycle. As creators are not always aware of all the risks, heritage institutions actively seek their cooperation and provide guidance on creation and preservation. Deposit regulations should help to ensure that materials are indeed transferred to an archiving institution. Such regulations should not only be developed for records and publications, but also for instance for research data, by making deposit a condition of research grants.

51. Building a deep infrastructure capable of supporting a distributed system of digital archives would depend on trusted organizations capable of keeping materials alive for the long term. National libraries and archives are at present taking on this role, as are a number of specialized research institutes and data archives. There are, however, a range of other institutions that may have a task in preserving certain types of materials (digital photographs,

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BEST COPY AVAILABLE

sound, art, broadcasting materials) or preserving materials for a specific community (institutions with a local or regional task, research institutes in a specific discipline).

52. Digital archives need to be trusted organizations. Those who transfer materials for preservation have to be certain that integrity and authenticity are ensured, that technical measures are taken in time, and that rights and restrictions for access will be observed. At the moment, tasks and responsibilities of such trusted repositories have not been defined. The leadership of national institutions in testing models can help other heritage institutions to understand the requirements for an operational preservation system and to set up systems for their own field.

53. Preservation of digital heritage is as yet an unknown territory for most institutions. When they take on responsibilities in this area, they will have to adapt organizational structures and redefine tasks of staff. Cooperation and exchange of experience will be essential to avoid expensive mistakes, and training programmes for staff are a priority for all institutions facing the digital challenge.

54. Cooperation, guidance, leadership and sharing of tasks are all key elements of programmes for preservation of digital heritage. Cultural institutions need the cooperation of creators of information and of software producers. The creation of a system of distributed archives depends on national guidance as well as international cooperation. However, the terrain is so new and experience as yet so limited, that immense efforts will be needed to build up the necessary infrastructure. Adequate resources and support at policy level are indispensable to ensure that future generations will still have access to the wealth of digital resources in whose creation we have invested so much over the past decades.

(i) Annex II

Annex III ELEMENTS FOR A CHARTER

D. Preamble

Reference to the Constitution of UNESCO and to its specific mandate to ensure the preservation and promotion of the world's cultural heritage and its diversity.

Reference the Information for All Programme, providing a platform for discussion and guidelines for action on issues such as preservation of information and universal access to it, and participation of all in the emerging global information society

E.

F. Scope

1. A large part of the world's information is now produced digitally, and most of this exists in digital form only. The web functions as a resource for information and communication as well as a cultural space where a diversity of materials are produced that cannot easily be classified in well-known categories. Much of this digital material is

potentially of lasting value, whether cultural, legal, or practical, and new, pro-active strategies need to be developed to ensure it is saved for posterity.

2. The preservation of our digital heritage is a new responsibility that falls on the actors of the information society. It is an ongoing activity that requires commitment and involvement, not only from heritage institutions, but also from governments, policy makers, producers and users of information, the software industry and international professional organisations and associations. Solutions depend on large-scale cooperation and the creation of a lasting infrastructure. Lessons learnt from the preservation of other forms of world heritage, whether intangible or tangible, such as monuments, manuscripts, printed or audiovisual documents, should be kept in mind.

Roles and responsibilities

3. Considering the exponential growth of the digital domain, clear preservation objectives both in qualitative and quantitative terms should be set. Guidelines should be provided to all concerned parties, and particularly national heritage institutions, as to which records should be preserved, and whether they should be preserved in a comprehensive and systematic way or only on a periodic sampling basis.

4. A clear division of tasks and responsibilities, based on existing roles and expertise, needs to be established in order to attain an infrastructure of distributed archives, functioning as trusted digital repositories. It should be established, in particular, how tasks can be shared between national heritage institutions and organizations working for specific discipline-oriented communities, at national, regional and international levels.

G.

H.

I.

J. Awareness raising

5. Awareness of preservation issues should be raised with producers of digital information. They should realize the importance of the use of standards and open source software and of adequate description and documentation. Outreach strategies of heritage institutions are needed to provide guidance and establish strong cooperation with the creators of materials.

6. The ICT industry should be made aware of the need to take preservation requirements into account. The value of standards and open source software should be promoted among software developers. They should be encouraged to make detailed and complete specifications of their products publicly available, especially for (versions of) programmes no longer on the market. Initiatives should be developed to build sustained repositories of specifications, documentation and related software.

Legal aspects

7. Existing legislation should be adapted to support national heritage institutions in the preservation of digital materials. Deposit legislation should extend to all materials regarded as publications, and legal frameworks for archives should include everything that constitutes a record, in whatever format it was produced. Additional procedures will have to be developed for materials that fall outside these categories (such as research data).

8. Copyright legislation should not act as an impediment for preservation of digital heritage. Owners of rights, of content as well as software, should be convinced of the need to allow heritage institutions to take actions necessary for preservation of materials. It should be possible to carry out such actions in the framework of general agreements specifying conditions for access and use.

K. Research and training

9. Further research to develop promising models and technology should be widely supported in order to achieve fully operational systems for preservation of digital heritage as quickly as possible. While the digital world moves ahead at a rapid pace, there is a serious risk that materials will be left behind and irretrievably lost. With so many resources being invested in the creation of digital materials, it is crucial to stimulate efforts aimed at ensuring their accessibility for future generations.

10. The leadership role in digital preservation of heritage institutions worldwide should be acknowledged. Their pioneering work in exploring legal, organizational, technical and economic aspects can provide the basis for defining best practices which should be strongly promoted in the whole community.

11. Extensive training programmes are needed to disseminate the expertise and experience gathered so far widely among management and staff of heritage institutions. Preservation of digital heritage requires new organizational structures, new approaches and new ways of thinking. Programmes will have to focus, not only on technical aspects, but also on training staff to deal with a changing environment and new directions.

Solidarity and strengthening capacities

12. In the face of the current digital divide, it is necessary to reinforce international cooperation and solidarity aimed at enabling all countries, especially developing countries and countries in transition, to ensure preservation and continued accessibility of their digital heritage, through sharing experience, disseminating results and best practices and concluding twinning arrangements.

13. Market forces alone cannot guarantee the preservation and promotion of the world's digital heritage. From this perspective, the pre-eminence of public policy, in partnership with the private sector and civil society, must be reaffirmed.

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
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